

Town of Monson

Water & Sewer Department

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CONSTRUCTION STANDARDS (Water)

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APPENDIX A: Tighe & Bond engineering specification section 02502 “**Testing of Water Distribution Systems**”

APPENDIX B: Tighe & Bond engineering specification section 02501 “**Disinfection of Water Distribution Systems**”

APPENDIX C: “**The Monson Water and Sewer Department Water Rate & Fee Schedule**”

I. Emergency Numbers
Nights – Weekends – Holidays

TOWN OF MONSON

FIRE DEPARTMENT _____ 911 / Bus.(413) 267-3132

HIGHWAY DEPARTMENT _____ (413) 267-4135

POLICE DEPARTMENT _____ 911 / Bus.(413) 267-4128

WATER DEPARTMENT _____ (413) 267-4130

SEWER DEPARTMENT _____ (413) 267-4130

OTHER UTILITIES/AGENCIES

DIG SAFE _____ (888) 344-7233

BAY STATE GAS COMPANY _____ (800) 792-2444

DEPARTMENT OF ENVIRONMENTAL PROTECTION
(Emergency Response Hazardous Waste Spills) _____ (617) 556-1133

II. Conditions of Service

Any person, group, business or corporation, contractor, land developer, subdivider, real estate operator or home builder of one (1) unit or more, hereinafter referred to as the "*Developer*", planning a housing, commercial or industrial development within the Town of Monson and for which it intends to apply for municipal water service, shall comply with the following procedures.

1. At the time of submission of the preliminary development plan to the Planning Board the *Developer* shall furnish the Monson Water & Sewer Department with a similar preliminary plan, which shall be used by the Monson Water & Sewer Department for determining if the proposed development can be served by the municipal water system.
2. The preliminary plan submitted to the Monson Water & Sewer Department, hereinafter referred to as the MW&SD, shall show:
 - A. The general pattern of proposed streets.
 - B. Adjoining existing streets and the sub-divisions/improvements existing thereon.
 - C. U.S.G.S. ground elevations for the area.
3. The plan shall be prepared in a workmanship manner and in sufficient detail to permit engineering analysis and shall be prepared and sealed by a Professional Engineer registered in the Commonwealth of Massachusetts.
4. In the event that the development or project is at a location or is of such a type as to not require Planning Board approval or action under the General Laws, Subdivision Control, then these MW&SD requirements shall still apply.
5. The MW&SD will use this preliminary plan for the purpose of determining whether or not the proposed development can be served from the municipal water system.

In the event the MW&SD determines that the proposed development can be properly served by the municipal water system, then the *Developer* may proceed to the **Conditions of Construction**, at his option.

III. Conditions of Construction

III.1. Construction Standards

If the *Developer* wishes to proceed with this development and MW&SD has determined that the development can be served from the municipal water system, then the developer may proceed as follows:

1. At the time of submission of the Definitive Subdivision Plan to the Planning Board and/or Town Building Inspector as provided for under the Subdivision Regulations of the Town of Monson the *Developer* shall furnish the MW&SD with a similar set of plans, which shall be used by the MW&SD for review and/or approval of the water piping system.

Monson Water & Sewer Department Construction Standards (Water)

- A. The Definitive Subdivision Plan shall show all proposed and existing utilities (gas, electric, telephone, etc.) in addition to the information included in the aforementioned Preliminary Development Plan
 - B. The Definitive Subdivision Plan shall also include a book of water piping system construction specifications for review by the MW&SD.
2. The piping system shall meet the following minimum requirements and shall be subject to the approval of the MW&SD:
- A. Pipe shall be cement lined tar coated, Ductile Iron, Class 52, 8-inch minimum.
 - B. Hydrants shall be placed at 400 feet maximum.
 - C. A hydrant shall be located at every street intersection.
 - D. Hydrants along a street shall be located opposite the common property line of two lots.
 - E. Every hydrant shall be equipped with a 6-inch shut-off valve, bolted or anchored to the hydrant tee.
 - F. Line valves shall be spaced at not more than 800 feet and as determined by the MW&SD.
 - G. In new construction, every intersection shall be valved "(3) three-ways" if a tee is used; and "(4) four-ways" if a cross is used.
 - H. Connections to the existing water system shall be made by a "cut-in" and shall be valved "three-ways" whenever practical.
 - I. Dead ends shall be avoided by the looping of all water mains whenever practical. Acquisition of property or easements and related construction costs and engineering services necessary for looping shall be the responsibility of the *Developer*.
 - J. All water mains and service piping shall be laid in a trench with an absolute minimum of five (5) feet of cover.
 - K. All water mains and service pipe shall be laid in a trench separate from any other utility. The horizontal distance between water mains or service pipe and any other utility (gas, electric, telephone, etc.) shall be at a minimum no less than five (5) feet and no less than ten (10) feet from a sanitary sewer or surface water drain.
 - L. All material shall be in accordance with Article IV " **Material Standards** " attached hereto. All material shall be new and shall be of the type currently used by the MW&SD.
 - M. All design and construction shall be in accordance with the current practices of the MW&SD and the following standards and specifications:
 - 1) The "Commonwealth of Massachusetts, Department of Public Works - Standard Specifications for Highways and Bridges".
 - 2) All applicable standards of the American Water Works Association (AWWA).

- 3) All applicable standards of the American National Standards Institute (ANSI).
 - 4) The "MassDEP Guidelines and Policies for Public Water Systems".
 - 5) All state and local plumbing codes.
3. Connections to the existing water distribution system can be made only during the period beginning April 1st and ending November 1st (7 months) and is subject to the availability of "hot" bituminous concrete for road repair. Connections outside of this period can be made only by approval of the Highway Surveyor and the Water & Sewer Superintendent and if the *Developer* assumes responsibility for maintenance and repair of the excavated area and provides the necessary equipment and manpower to excavate, backfill, and restore the trenched area to the satisfaction of the Highway Surveyor. The *Developer* shall be required to obtain the necessary permits to excavate within the public ways i.e. Dig Safe, Town of Monson Highway Department, etc., and shall be subject to any conditions imposed thereon. Preparation and restoration of any road or sidewalk surface shall be in accordance with the Monson Highway Departments Specifications.
 4. Connections to the existing water distribution system will be made by the MW&SD Personnel or by a contractor approved by the Superintendent of the MW&SD. The *Developer* will pay the full cost of labor, materials and equipment required for the construction of such connection.

III.2. Responsibilities of the Developer

1. The *Developer* shall be required to provide and pay for construction, installation, testing and disinfecting of consumer water mains, pipes, valves, hydrants and fittings in streets and ways as designed, specified and approved by the Board of Water & Sewer Commissioners and/or the Superintendent of the MW&SD.
2. Within the subdivision, the Developer shall carry out water main and service pipe construction using a contractor that meets the approval of the MW&SD. The contractor shall install said house service connections at the expense of the *Developer*. The *Developer* will pay the full cost of all labor, materials and equipment required for construction, as shown on MW&SD approved Definitive Plan.
3. The *Developer* must provide satisfactory credentials indicating the capabilities and experience of the contractor. Once approved, no changes in the contractor shall be made.
4. The *Developer* shall pay for the time of an inspector designated by the Superintendent of the MW&SD who will be present at all times during construction, and said work shall be subject to acceptance by the Superintendent of the MW&SD. The *Developer* will be required to coordinate this construction activity so that full-time inspection can be provided easily and economically. All construction by the MW&SD personnel will require no further inspections.
5. The above-mentioned *Developer* shall post a "performance guarantee bond" for an amount as deemed appropriate by the MW&SD and/or the Monson Highway Department. The amount of said guarantee shall be reduced from the original requirement to ten percent (10%) of the cost of installation of the water system, once work has been completed. This guarantee shall insure maintenance of the system for a period of one (1) year from the date of completion of the project and/or commencement of use of the water system. Additionally, this money will be used to correct any deficiencies in the water system before the MW&SD assumes responsibility for its operation and maintenance.

6. The *Developer* will be responsible for submitting to the MW&SD, a complete set of "as-built" plans that contain all pertinent ties and measurements before the final 10% of the performance guarantee is returned.
7. All above-mentioned water mains, etc., shall become the property of the Town of Monson at the expiration of one (1) year from the date of final completion and pending final acceptance.
8. The *Developer* and/or his Contractor shall not operate any hydrants, valves, curb stops or corporations, nor shall they draw any water from the system, without specific approval of the MW&SD. Only MW&SD personnel will operate valves, hydrants, corporations, and curb stops, after authorization by the Superintendent. Failure to conform to these requirements will result in a \$ 50.00 assessment and loss of water service.

III.4. Fees, Charges and Final Acceptance

The *Developer* will be subject to and shall pay the following charges:

1. Entrance/Connection Fee: A basic charge for each connection to the existing or proposed water system. This charge is specified in Appendix C, "**The Monson Water and Sewer Department Water Rate & Fee Schedule**" which is subject to change without notice.
2. Materials Charge: The *Developer* shall bear the entire cost of any and all materials furnished by the MW&SD and used during the construction.
3. Construction Cost: The *Developer* shall bear the entire cost of constructing the proposed main piping and/or service pipe system, as shown on the MW&SD approved Definitive Plan.
4. Final Acceptance: When the *Developer's* water system has been completed, and has met all requirements of the MW&SD, all charges paid and a copy of the "as-built plans" submitted, a letter of acceptance will be sent to the *Developer* by the Board of Water & Sewer Commissioners. Only after the *Developer* has received the acceptance, will the date of final completion be set. The performance guarantee, as outlined previously, will be returned one year from the date of final completion providing the integrity of the water system has been maintained for the one year period.

IV. Material Standards

IV.1. Pipe

Distribution system pipe shall be at least 8-inches in diameter, shall be class 52 ductile iron pipe, cement lined and bituminous tar coated per AWWA Specifications. The pipe shall be as manufactured by the U.S. Pipe and Foundry Company or an approved equal by the MW&SD.

If the MW&SD determines that a pipe diameter larger than 8-inches will be needed to supply the Development, then the size shall be determined by the Board of Water & Sewer Commissioners and/or the Superintendent and shall be furnished and laid at the *Developer's* expense.

Pipe used for hydrant branches shall be at least 6-inches in diameter and shall meet the above specifications. Pipe used for sprinkler lines shall be at least 6-inches in diameter, unless it can be documented that a different size line will meet design specifications and shall meet the above specifications.

IV.2. Pipe Joints

Push-on type joints are recommended on straight runs of pipe. Gaskets must be standard for pipe used and be suitable to the MW&SD.

The MW&SD may require, under certain terrain conditions, that restrained type joints be used. The method of restraining may either be of an interlocking type or mechanical joint with retainer gland as specified by the MW&SD.

IV.3. Fittings

Ductile iron fittings must be used and shall be cement lined and bituminous tar coated. Fittings are required to be equipped with mechanical joints and retainer glands (Ford Uniflange Retainer 1400-D or an approved equal) unless otherwise specified by the MW&SD. Mechanical joint fittings in sizes 4-inch through 24-inch shall be ductile iron compact fittings and rated for 350 psi working pressure. Fittings shall be in strict accordance with AWWA specifications C-153 and C-111 for joints, C-104 for cement lining and C-111 for nuts and bolts.

IV.4. Tapping Sleeves

If or when the MW&SD deem the use of a tapping sleeve necessary it shall be of ductile iron construction using mechanical joint attachments. Tapping valve shall be resilient wedge design meeting AWWA C509 standard. (See specifications for gate valves for complete description).

IV.5. Couplings

A mechanical joint solid sleeve (see Section IV.3.) shall be the only type of coupling allowed when connecting two pipe ends of standard outside diameter. Bolted flex couplings shall only be allowed when connecting standard outside diameter pipe to oversize or pit cast pipe. The coupling shall be of a type equal to the TPS Hymax 2000 or an approved equal.

IV.6. Gate Valves

Gate Valves shall be of type manufactured by M&H Valve, US Pipe, Mueller or Clow, cast or ductile iron body, Resilient Wedge, AWWA Standard C-509, and equipped with a non-rising stem. The valves shall **OPEN LEFT**, counterclockwise. Gate valves will be equipped with mechanical joints and retainer glands, unless otherwise specified by the MW&SD.

IV.7. Gate Boxes

The gate boxes shall be telescopic in design with a two piece construction, a top with a cover and a bottom. The top and bottom shall be extra grade gray iron. The top shall be 24 inches in height and the bottom shall be 36 inches in height. The top section shall have a top flange to increase the stability of the box to remain at the present height. The lower section of the box shall have a bell shaped bottom designed to enclose the operating nut and stuffing box of the valve **without bearing on the valve bonnet**. The gate box shall come complete with a cover on which the word "**WATER**" shall be cast. The cover of the gate box shall be close fitting and substantially dirt tight and flush with the top of the box rim. Gate boxes shall be installed for each buried valve.

The gate box extension shall be 12 inches to 15 inches in length. The extension shall be extra grade gray iron and shall fit on the top of the bottom section of the gate box.

The gate boxes shall be of **North American** manufacture.

IV.8. Hydrants

Hydrants shall be the **M & H Reliant 929**, which meets or exceeds AWWA Standard C502 with a working pressure rating of not less than 200 psi. They shall **OPEN LEFT**, counterclockwise, and shall have one steamer connection, 4½-inch diameter NST and two 2½-inch diameter NST hose connections. The valve opening at the base of the hydrant shall be 5¼-inch minimum. Hydrant operating nut shall be 1½ inch, flat to point, pentagonal.

The length of the hydrant barrel shall be such that, when installed with the proper depth of cover on the branch pipeline, the hydrant will be set with the normal ground line of the barrel within 3-inches of the actual finished ground grade surface elevation. For the most part, minimum bury length shall be 5 ½ feet.

Connecting pipe and pipe nipples between the main line tee and hydrant shall be 6-inch ductile iron conforming to the requirements for ductile iron pipe herein before.

IV.9. Hydrant Tees (Anchoring Tees)

Hydrant tees shall be anchor type and have line bells conforming to the requirements of the main pipe. The branch shall have a plain end with an integral gland and rotating mechanical joint gland to provide a restrained connection. Hydrant valve and valve box shall be a standard 6-inch, mechanical joint, approved water works gate valve, **OPENING LEFT**. (See specifications for gate valves for complete description).

IV.10. Thrust Blocking

Where applicable, reaction or thrust blocks of concrete shall be constructed at all tees, plugs, and bends as directed or as detailed on drawings with 3,000 psi concrete. The blocks shall be poured against undisturbed original ground and shall be so placed that pipe joints will be accessible for any possible future repairs. Yokes and tie-rods shall be installed in addition to or in lieu of thrust blocks. Pipe anchors shall be used when and as directed.

IV.11. Service Piping & Connections

Service pipe shall be type "K" copper tubing of American manufacture, 1 -inch minimum from the main to the house or building. With prior approval, 200 psi, copper tube size (CTS), polyethylene tubing (SDR9) may be substituted from the curb box to the house or building. All service fittings shall be extra heavy brass, manufactured by Ford Meter Box Company, Inc.

IV.12 Service Saddles

For water services 1½ or 2 inches in diameter a service saddle must be used. The service saddle shall be the Ford F202 series as manufactured by the Ford Meter Box Company, Inc. or an approved equal. The body shall be made of high strength ductile iron per ASTM A536 with black E-Coating. The straps shall be 5/8 inch AISI C1010 steel, zinc plated with Di-chromate seal and with a 5/8 inch flat bearing surface. The gasket shall be made of Buna-N rubber, ASTM-D2000. If soil conditions at the point of use are shown to be highly corrosive, the MW&SD may require the use of stainless steel straps and nuts.

IV.13. Corporations

All size corporations shall be the Ford Ballcorp™ FB-1000 series which incorporates an EPDM stem o-ring and Buna-N rubber seats to assure self-centering of a fluorocarbon-coated bronze ball, or a MW&SD approved equal. The corporation shall be easy turning and non-binding. The inlet shall be an AWWA (CC) thread. The outlet shall be Q-Type compression, the same size as the inlet. All corporations shall be subject to a sustained hydraulic pressure of 200 psi and tested in both the open and closed positions for leakage and ease of turning.

IV.14. Curb Stops

All size curb stops shall be the Ford B-44 series, which incorporate EPDM stem o-rings and Buna-N rubber seats to assure self-centering of a fluorocarbon-coated bronze ball, or a MW&SD approved equal. The curb stop shall have a quarter turn stop with check, solid tee head and no waste. No curb stops with plugged wastes shall be accepted. Curb stops shall **OPEN LEFT** counterclockwise and have Q-Type compression inlets and outlets.

IV.15. Service Line Fittings

The following table indicates the Ford brass service line fittings currently in use by the MW&SD.

Ford Meter Box Company Part Numbers				
Item	¾ Inch	1 Inch	1 ½ Inch	2 Inch
Corporation	FB-1000-3-Q	FB-1000-4-Q	FB-1000-6-Q	FB-1000-7-Q
Curb	B44-333-Q	B44-444-Q	B44-666-Q	B44-777-Q
Male Adapter	C84-33-Q	C84-44-Q	C84-66-Q	C84-77-Q
Valve	B11-333H	B11-444H	B11-666H	B11-777H

IV.16. Service Boxes

Service boxes supplied shall be Erie style, American manufactured, of an extendable type with a length from 4.5' to 5.5'. The cover shall be made of extra grade gray iron. The arch shall accommodate up to 1-inch curb stops. The upper section shall be a 1-inch extendable pipe made of steel. The cover shall be counter sunk with a brass pentagonal plug that features a coarse "rope" thread to enable quick and easy removal.

The service boxes supplied shall come complete with **24-inch stop rods**. The stop rod shall be 5/8-inch diameter and offset for centering in the pipe. The stop rod shall have a heavy ductile iron end yoke with a brass cotter pin.

V. Miscellaneous Requirements

V.1. Pressure & Leakage Testing

1. **Appendix A** contains the Tighe & Bond engineering specification section 02502 "**Testing of Water Distribution Systems**", including the requirements for pressure and leakage testing.
2. The pressure and leakage tests shall be as specified in Appendix A and as recommended by § 301.60.L of the Standard Specifications for Highways and Bridges and the American Water Works Association Standard C600-87, § 4.1.
3. In general, the water pipe shall be given a pressure and leakage test in sections of approved length. For these tests, the Contractor shall provide a method of determining the exact amount of water being pumped into the test section and a **NEW**, as in **unused**, pressure gauge (200 psi, 4-inch diameter, 2 psi graduations **only**). The Contractor shall also furnish and install suitable temporary testing plugs or caps for the pipeline; all necessary pressure pumping, pipe connections and other similar equipment; and all labor required; all without additional compensation. Prices for the appropriate pipe items shall include compensation for testing. The test equipment shall be installed by the Contractor

in such a manner that all water entering the section under test will be measured and the pressure in the section indicated, and they shall be kept in use during all tests.

4. The scheduling of pressure and leakage tests shall be approved by the Superintendent of the Water & Sewer Department and shall be attended by him or a representative of the MW&SD.
5. Unless it has already been done, the section of pipe to be tested shall be filled with water of approved quality, and all air shall be expelled from the pipe. If air release assemblies are not available at high points for releasing air, the Contractor shall make the necessary excavations and do the necessary backfilling, and make the necessary taps at such points.
6. If the section fails to pass the pressure and leakage test, the Contractor shall do everything necessary to locate, uncover, even to the extent of uncovering the entire section, and repair or replace the defective pipe, fitting, or joint all at his own expense and without extension of time for completion of the work.
7. If, in the judgement of the Superintendent, it is impractical to follow the fore-going procedure exactly, for any reason, modification in the procedures may be made as required or approved, but in any event the Contractor shall be responsible for the ultimate tightness of the line within the above leakage requirements.

V.2. Disinfection & Flushing

1. **Appendix B** contains the Tighe & Bond engineering specification section 02501 “**Disinfection of Water Distribution Systems**”.
2. After a section of the main has been pressure tested and found acceptable, it shall be flushed thoroughly by the Contractor. Flushing the completed main is to be followed by sterilization in accordance with the procedures outlined in **Appendix B** and as recommended by the **AWWA Standards for Disinfecting Water Mains (ANSI/AWWA C651-86)**. Test results for chlorine residuals for times as specified in the method of disinfection, must be submitted to the MW&SD. All valves and hydrants should be operated during treatment to insure their thorough contact with the disinfecting solution.
3. The pipeline should then be flushed free of all the heavily treated water. Following flushing, the water should be tested chemically for residual chlorine and bacteriologically for Coliform Group Bacteria. A Massachusetts State Certified laboratory must do the testing and the results of all tests must be submitted to the MW&SD. The **Contractor** shall be solely responsible for all costs associated with the aforesaid test.
4. The quality of the water should remain acceptable for at least two days after the flushing.
5. A report containing amounts of water flushed, amounts of chlorine used and chlorine residuals after the test period must be submitted to the MW&SD.
6. If the initial treatment fails to produce the desired result, the chlorination procedure must be repeated.
7. This work shall be done under the direction and supervision of a representative of the MW&SD. For this work, the Contractor shall furnish all equipment, material and labor required.

VI. APPENDICES